

**REMARKS**

The Official Action mailed January 26, 2006, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant appreciates Examiner Guerrero's time in conducting a personal interview on March 21, 2006. As described in more detail below, during the interview the Applicant's representative stressed that the prior art, either alone or in combination, does not teach or suggest that a semiconductor device is flexible, and the prior art does not contain sufficient motivation to teach or suggest that it would have been obvious to combine a solar cell with a TFT having a glass substrate in order to achieve the features of the present independent claims. The Examiner agreed to consider the Applicant's remarks following the submission of this *Amendment*.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on April 2, 2004; June 30, 2004; October 13, 2004; January 10, 2005; January 27, 2005; March 3, 2005; March 15, 2005; May 17, 2005; October 25, 2005; and December 8, 2005. A further Information Disclosure Statement is submitted herewith and consideration of this Information Disclosure Statement is respectfully requested.

Claims 1-84 are pending in the present application, of which claims 1-20, 27-58 and 72-79 are independent. Claims 1-27, 29-31, 37-39, 41-43, 49-51, 53-55, 57-60, 64, 65, 73, 75, 77 and 79 have been withdrawn from consideration by the Examiner (page 2, Paper No. 20060120). Accordingly, claims 28, 32-36, 40, 44-48, 52, 56, 61-63, 66-72, 74, 76, 78 and 80-84 are currently elected, of which claims 28, 32-36, 40, 44-48, 52, 56, 72, 74, 76 and 78 are independent. Claims 28, 32, 36, 40, 44, 48, 52, 56, 61, 62, 72, 74, 76 and 78 have been amended to better recite the features of the present invention. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 6 of the Official Action objects to claims 61 and 62 as multiple dependent claims that do not "refer to other claims in the alternative only" (page 3, Id.). In response, claims 61 and 62 have been amended to refer to other claims in the alternative only. Reconsideration and withdrawal of the objections are requested.

Paragraph 7 of the Official Action rejects claims 28, 32, 36, 44, 48, 52, 66-72, 76, 78, 80, 83 and 84 as obvious based on the combination of U.S. Patent No. 5,032,883 to Wakai et al. and U.S. Patent No. 5,427,961 to Takenouchi et al. Paragraph 8 of the Official Action rejects claims 40, 56, 63, 66-71, 74 and 80-82 as obvious based on the combination of Wakai, U.S. Patent No. 5,456,763 to Kaschmitter et al. and Takenouchi. Paragraph 9 of the Official Action rejects claims 44, 48, 52, 66-69, 76, 78, 80, 83 and 84 as obvious based on the combination of JP 63-279228 to Nishiki et al. and Takenouchi. With respect to claims 28, 32, 36, 40, 44, 48, 52, 56, 72, 74, 76 and 78, the Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended. With respect to claims 33-35 and 45-47, the Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole

would have suggested to those of ordinary skill in the art.” In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Independent claims 28, 32, 36, 40, 44, 48, 52, 56, 72, 74, 76 and 78 have been amended to recite that a semiconductor device is flexible. Independent claims 32-36, 40, 47, 48, 52 and 56 recite a thin film transistor formed over a flexible substrate with a resinous layer interposed therebetween. Independent claims 44-48, 52 and 56 recite a pair of flexible or filmy substrates.

Initially, in response to a request by Examiner Guerrero in the personal interview held March 21, 2006, the Applicant notes that support for the recitation of a “filmy substrate” appears in the present specification, for example, at page 2, lines 11+. The “material of the filmy resinous substrate can be selected from PET (polyethylene terephthalate), PEN (polyethylene naphthalate), PES (polyethylene sulfite), and polyimide” and use of such materials as a substrate provides “flexibility and transparency,” which is an example of the criticality of this feature to the present application. Normally, such materials are not used as a substrate for a semiconductor device, because if such materials are elevated above 200°C, undesirable oligomers or gases are produced.

Also, in response to the Examiner’s request, the Applicant notes that support for the recitation of “a pair of substrates” appears in the present specification, for example, in Figure 3. A pair of substrates is necessary to form a display device such as the liquid crystal electrooptical device shown in Figure 3. Specifically, for example, a pair of substrates 301 and 302 are used to contain liquid crystal 309.

Wakai, Kaschmitter, Takenouchi and Nishiki, either alone or in combination, do not teach or suggest that a semiconductor device is flexible.

Wakai is directed to a thin film transistor with a glass substrate, and Nishiki is directed to a liquid crystal display device with a glass substrate. In fact, the Official

Action concedes that "Wakai et al. does not specifically show the substrate being a flexible substrate and forming a resinous layer over the first flexible substrate" and that "Nishiki et al. fails to disclose the substrate being a resinous substrate" comprising one of the claimed materials or "the resinous material" comprising one of the claimed materials (pages 4 and 7, Paper No. 20060120). The Official Action relies on Takenouchi to allegedly teach "a semiconductor having a resinous substrate ... made of polyester ..., polyimide, fluoroplastic, PES" (pages 4 and 8, Id.).

Although Takenouchi appears to teach "a substrate having flexibility" for use in solar cells, Takenouchi does not teach or suggest that the solar cells are or should be flexible. Therefore, Wakai or Nishiki and Takenouchi do not teach or suggest a flexible semiconductor device.

Since Wakai, Kaschmitter, Takenouchi and Nishiki do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Wakai, Nishiki, Takenouchi and Kaschmitter or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be used together, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references "could have been" combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." In re

Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

Please incorporate the deficiencies in the teachings of Wakai or Nishiki and Takenouchi, noted in detail above. The Official Action asserts that “it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Wakai et al. ... by including the resinous substrate taught by Takenouchi et al. in order to reduce the cost and to obtain a device easily handled having a larger field of application” (pages 5 and 8, Id.). The Applicants respectfully disagree and traverse the above assertions in the Official Action.

Each of the independent claims recites a pair of flexible substrates, and a semiconductor device having flexibility. However, each of Wakai and Nishiki is directed to a device on a glass substrate. There is no suggestion in Wakai or Nishiki about the desirability of a flexible device or flexible substrate. Takenouchi does not teach or suggest replacing a glass substrate with a flexible substrate, the interchangeability of glass and flexible substrates or creating a flexible device, and the asserted motivation (“reduce the cost and to obtain a device easily handled having a larger field of application”) does not teach or suggest replacing the glass substrate of Wakai or Nishiki with the flexible substrate of Takenouchi and creating a flexible device.

Also, as noted above, in addition to the recitation of a flexible semiconductor device, independent claims 32, 36, 40, 48, 52 and 56 further recite a thin film transistor formed over a flexible substrate with a resinous layer interposed therebetween. These claims are even more patentable than, for example, claim 28, which does not include this feature. In the present application, “[the] resinous layer is formed to prevent generation of oligomers on the surface of the resinous substrate during formation of the film and to planarize the surface of the resinous substrate” (abstract). In Takenouchi, the protective layer is provided in order to prevent oligomers in a PET film substrate from penetrating the device formed on the substrate (column 3, line 65, to column 4, line

2). However, since Wakai and Nishiki are formed on glass substrates, there is no problem with oligomers in Wakai and Nishiki; therefore, there is no reason to use a protective layer from Takenouchi in the device of Wakai or Nishiki.

Further, the main purpose of Takenouchi is a solar cell application, while Wakai is concerned with liquid crystal displays; therefore, it is unclear why one concerned with solar cells would look to Wakai for improvement or why one concerned with LCDs would look to Takenouchi for improvement. Independent claims 44-48, 52 and 56 recite a pair of flexible or filmy substrates. As noted above, a pair of substrates is required for forming a display device such as a liquid crystal display. A solar cell, such as that disclosed in Takenouchi, does not require a pair of substrates. Therefore, it is not clear why one of ordinary skill in the art would have been motivated to use Takenouchi, which does not require a pair of substrates, with the devices of Wakai or Nishiki, which require a pair of substrates.

Still further, the insulating film 108 in Wakai is provided in order to flatten the surface above insulating substrate 101 (column 4, lines 59-62). It is not clear why one of ordinary skill in the art who was instructed to use a flattening insulating film in Wakai would then be motivated to produce a flexible device.

It is not sufficient to merely point out the advantages of two or more references and assert that it would have been obvious to combine the two or more references so that you can have multiple advantages in one device. Rather, in order to form a *prima facie* case of obviousness, the Official Action must show why the references should have been combined.

Kaschmitter does not cure the deficiencies in the alleged motivation to combine Wakai or Nishiki and Takenouchi. The Official Action relies on Kaschmitter to allegedly teach applying laser irradiation using KrF or XeCl excimer laser light (page 6, Id.). Kaschmitter do not show that it would have been obvious to combine Wakai or Nishiki and Takenouchi, i.e. that it would have been obvious to replace a glass substrate with a flexible substrate.

Therefore, the Applicant respectfully submits that the Official Action has not provided a proper or sufficient suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Wakai, Nishiki, Takenouchi and Kaschmitter or to combine reference teachings to achieve the claimed invention.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

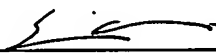
For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 11 of the Official Action rejects claims 28, 32, 36, 44, 48, 52 and 72 under the doctrine of obviousness-type double patenting over the combination of claims 1-3, 6-9, 12, 13, 15, 16, 18, 19, 21-26 and 29-43 of U.S. Patent No. 6,242,758 to Yamazaki et al. and U.S. Patent No. 5,066,110 to Mizushima et al. Paragraph 12 of the Official Action provisionally rejects claims 28, 32, 36, 44, 48, 52, 66-72, 76, 78 and 80 under the doctrine of obviousness-type double patenting over the claims of copending application Serial No. 10/815,653.

As is discussed in greater detail above, independent claims 28, 32, 36, 40, 44, 48, 52, 56, 72, 74, 76 and 78 have been amended to better recite that a semiconductor device is flexible. In light of this amendment, the Applicants respectfully traverse this ground for rejection and reconsideration of the pending claims is respectfully requested. In any event, the Applicants respectfully request that the double patenting rejections be held in abeyance until an indication of allowable subject matter is made in the present application. At such time, the Applicants will respond to any remaining double patenting rejections.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

  
Eric J. Robinson  
Reg. No. 38,285

Robinson Intellectual Property Law Office, P.C.  
PMB 955  
21010 Southbank Street  
Potomac Falls, Virginia 20165  
(571) 434-6789